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# Bare Plural Subjects, Inflection, and the Mapping to LF

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## 0.0 Introduction

In this paper I examine Carlson's (1977) correlation between the classification of predicates as stage-level (roughly, temporary states) and individual-level (more or less permanent states) and the existential and generic interpretations of bare plural subjects.[1] The following examples illustrate this correlation:

(1) Stage-level (existential/generic):
a. Carpenter ants are destroying my viola da gamba.
b. Firemen are available.

(2) Individual-level (generic):
a. Carpenter ants have six legs.
b. Cows are dim-witted.

Following recent analyses of bare plurals along the lines of the analysis of indefinites developed in Heim (1982) (e.g. Wilkinson (1986, 1988), Gerstner and Krifka (1987)), I assume that the two possible readings of the bare plural result from different logical representations.[2] In addition, I examine the distribution of existential and generic readings with respect to the stage/individual level contrast and show that this contrast can be correctly captured in the Heim-style framework by proposing that the subjects of the two types of predicates map into logical

1 In this paper I will be concentrating on English and German, which have bare plural NPs in addition to NPs with overt determiners. I will leave open the question of how much of what I claim about bare plural NPs in these languages carries over to languages without overt determiners of any kind, and those languages which do not allow bare plural NPs.

form in different ways. This difference between the two predicates is derived by positing two types of Infl associated with the two types of predicates. This distinction parallels the contrast between raising and control predicates.

This proposed account of the difference between the two types of predicates leads to a discussion of the problem of mapping S-structure representations onto logical representations (LF). In section 2 I consider this question for English and German in the light of recent papers by Chomsky (1989) and Pesetsky (1989) concerning principles governing derivations. Finally, I discuss data from German in which the proposed syntactic account of the difference between the two types of predicates is confirmed by an extraction contrast.

## 1.0 The Stage/Individual Distinction

In this section I examine the stage/individual distinction and the distribution of generic and existential readings of bare plural subjects. I propose to account for the difference between the two types of predicates in terms of how the subjects are mapped into the logical representation. I first review the essential details of the Heim-style analysis.

### 1.1 A Restricted Quantifier Analysis

The logical representations consist of three parts (following Heim's terminology):

1. an unselective quantifier
2. the Restrictive Clause
3. the Nuclear Scope

2 A similar approach is taken by Farkas and Sugioka (1983) in analyzing if/when clauses.

The Restrictive Clause functions as a restriction on the variables quantified over by the quantifier, which in turn unselectively binds variables in the Nuclear Scope. In (3) **Most** is the unselective quantifier, which is restricted to quantifying over those things that are pigs, and the Nuclear Scope (x has wings) contains a variable which is bound by the quantifier.

(3) a. Most pigs have wings.
b. Most [x: x is a pig] x has wings

The restricted quantifier analysis of bare plurals relies on two further assumptions. First, in the absence of an overt quantifier, NPs which have been "raised" to the Restrictive Clause are bound by a default quantifier **Gen**. A precise description of this quantifier is beyond the scope of this paper, but I will assume that it has a meaning similar to the adverbs 'generally' and 'typically' (Kroch 1974, Farkas and Sugioka 1983, Wilkinson 1988). In other words, **Gen** is not strictly a universal quantifier, as it must be able to admit exceptions. Variable binding by **Gen** results in a generic reading, as in (4) and (5):

(4) a. Ungulates have hooves.
b. Gen [x is an ungulate] x has hooves

(5) a. Bad cellists are prosecuted in criminal court.
b. Gen [x is a bad cellist] x is prosecuted in criminal court

The logical forms in (4b) and (5b) state that generally all those things that are ungulates have hooves, and generally bad cellists are prosecuted in criminal court (barring any intervening complications such as a deformed ungulate, or a bad cellist with Congressional immunity).

The second assumption is that there is an obligatory process of Existential Closure (Heim 1982) which binds any NPs which remain in the Nuclear Scope (i.e. those NPs that

have not been raised to the Restrictive Clause). In a restricted quantifier analysis of bare plurals Existential Closure results in an existential reading of the bare plural. This is motivated by examples such as the following:

(6) a. Lions have manes.
b. Gen [x is a lion] ∃ mane(y) ∧ has(x,y)

The existential reading of the bare plural subject is also represented in terms of Existential Closure. If the bare plural remains in the Nuclear Scope (is not "raised" to the Restrictive Clause), it is obligatorily bound by Existential Closure, rather than by Gen. This is illustrated in (7) and (8).

(7) a. Cows are in my backyard.
b. ∃x cow(x) ∧ in-my-backyard(x)

(8) a. Bad cellists ruined the concert.
b. ∃x bad cellist(x) ∧ ruin-concert(x)

In these examples there is no Restrictive Clause, nor is there an unselective quantifier (neither Gen nor any other). Thus, the bare plural is bound by Existential Closure, resulting in an existential reading. (7b) thus asserts the existence of cows in my backyard, and (8b) asserts the existence of bad cellists who ruined the concert. Unlike Heim (1982), I assume that there is no existential closure of texts. The existential closure of the Nuclear Scope is the only existential closure operation available (or necessary). For arguments supporting this assumption, see Kratzer (1989).

1.2 Distribution of Readings for Bare Plural Subjects

In this section I discuss the the different possible readings of bare plural subjects with stage-level and individual-level adjectival predicates. The distribution of readings will lead to a formulation of the stage/individual

contrast in terms of where the subject NPs of each type of predicate can be represented in the logical representations.

1.2.1 Stage-Level Predicates

Close examination of sentences with stage-level predicates reveals that not only are both existential and generic quantification allowed, but there are also apparent interactions between existential quantification and generic quantification. In other words, a stage-level predicate can have both existential properties and generic properties at the same time. A stage-level predicate like **available** allows the following readings:

(9) a. Firemen are available.

b. ∃ fireman(x) ∧ available(x)

c. Gen[x is a fireman,t is a time]available(x,t)

d. Gen[t is a time] ∃fireman(x) ∧ available(x,t)

The first reading is the existential reading. On this reading there are firemen available at some point in time. The second reading is a generic reading expressing a dispositional attribute of firemen; it is a necessary property of a fireman that he/she be generally available. A person who is likely to give other commitments a higher priority than firefighting shouldn't be a fireman.

Finally, in the third reading the existential quantification is under the scope of a generic operator: "Generally, there are firemen available." In this case the generic operator may perhaps bind times. One context in which this reading may arise is in which firemen work short shifts, but there are always some firemen on call. Thus, not only are the stage-level adjectival predicates ambiguous between generic and existential readings, but multiple generic readings are in fact possible.[3]

1.2.2 Individual-Level Predicates

While stage-level predicates may give rise to either the existential or the generic reading of a bare plural subject, individual-level predicates appear to be more restricted. There is an asymmetry between the two types of predicates: individual-level adjectival predicates seem to allow only the generic reading, and do not seem to allow existential readings, as illustrated by (10):

(10) a. Linguists are intelligent.
b. Linguists know French.

Unlike like the case of the sometimes implausible generic readings with stage-level predicates, the absence of the existential reading does not appear to be due to pragmatic factors. The lack of an existential reading in (10a) has nothing to do with whether or not the subject NP linguists can be appropriately applied to intelligent. I can't think of any contextual situations in which (10a) could be taken to mean "there are intelligent linguists." The same applies to the predicate know French in (10b). Thus, while bare plural subjects of stage-level predicates can be bound by either the generic operator Gen or Existential Closure, subjects of individual-level predicates can only be bound by the generic operator. Since Gen only binds NPs that appear in the Restrictive Clause of the logical form, this difference between the two types of predicates can be expressed in terms of a difference in where the subject NPs can appear in the

3 The conclusions I reach with regards to the distribution of readings differ somewhat from those of Carlson (1977). Carlson assumes that stage-level adjectival predicates such as available allow only an existential reading, while individual-level adjectival predicates allow only the generic reading. At first glance, the examples below seem to confirm this:
(i) a. Pigs are available. (existential only)
b. Pigs are intelligent. (generic only)
I think that in fact that the generic reading in (i)a is ruled out pragmatically. While it is not unreasonable to expect that firemen might have a generic property of being available, it is in the actual world quite odd to expect the same of pigs.

logical form:

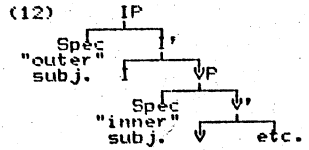
(11) Stage/Individual Level Distinction:
At logical form subjects of stage-level predicates can appear in either the Nuclear Scope (to be bound by Existential Closure) or the Restrictive Clause (to be bound by either the abstract quantifier **Gen** or an overt operator). Subjects of individual-level predicates can only appear in the Restrictive Clause.

There still remains the question of how the mapping to logical form is accomplished. In the next section I make a proposal for how the two types of subjects may be distinguished in the syntax to make this mapping possible.

## 2.0 The Mapping to Logical Form

The existence of two positions at LF in the Heim framework for the bare plural subject NP (either in the Nuclear Scope, or "raised" to the Restrictive Clause) brings to mind a parallel in recent proposals for clause structure. These analyses have drawn upon the possibility of two subject positions (eg. Kuroda 1988, Fukui 1986, Kitagawa 1986, Sportiche 1988, and others). While these proposals vary in details and in motivation, they have certain structural characteristics in common. In all of the analyses the two (or more) subject positions can be characterized as an "outer" position and an "inner" position. In the phrase structure framework outlined in Chomsky (1986), these two positions are represented as follows:

(12)




In this section I consider the possibility of the following correspondence between the two subject positions in

(12) and the tripartite logical form representations:

(13) Preliminary Mapping Hypothesis:
1. "inner" position ≈ NP within the Nuclear Scope
2. "outer" position ≈ NP forming a Restrictive Clause

Thus, in the mapping to logical form, the VP in the double-subject structure in (12) is taken to represent the Nuclear Scope, and the NP outside of the VP (in [Spec,IP]) falls into the Restrictive Clause.

If the correspondence described above does indeed hold, the difference between stage and individual level subjects can in fact be described in syntactic terms. At the level of logical representation (or some level relevant to logical interpretation), stage-level subjects can appear in either the "inner" or the "outer" subject position. Since the VP corresponds to the Nuclear Scope, subjects in the inner position can then be bound by Existential Closure. Individual-level subjects can only appear in the "outer" position, and are thereby mapped into the Restrictive Clause, with the result that only the generic interpretation is possible.

2.1 Derivation of the Stage/Individual Contrast

In English, it is clear that a positional distinction between the subjects of the two predicate types can only hold at the level of logical form, as all subjects must appear in [Spec,IP] at S-structure (presumably in order to be assigned Case). The question then arises of how the differing logical representations are derived from the uniform S-structures.

Assuming the correspondence between the phrase structure subject positions and the two possible positions in the logical representations outlined above, at logical form the subjects of stage-level predicates must be able to appear in either the [Spec,IP] (Restrictive Clause) or the [Spec,VP]

(Nuclear Scope). Subjects of individual-level predicates, on the other hand, can only appear in [Spec,IP] at logical form. In other words, subjects of stage-level predicates have the option of "lowering" from their S-structure position in [Spec,IP] (cf. May 1977, 1985) into [Spec,VP] in the mapping to logical form, while subjects of individual-level predicates do not have this option. Thus, the distinction between the two types of predicates can be restated as follows:

(14) LF-Mapping Principle (English):
Subjects of stage-level predicates can be mapped into either [Spec,IP] or [Spec,VP]. Subjects of individual-level predicates must stay in [Spec,IP].

This translation into syntactic terms still leaves open the question of why the two predicate types should differ in this way. Kratzer (1989) proposes to derive the difference from a difference in argument structure. Kratzer argues that stage-level predicates have a abstract "Davidsonian" spatio-temporal external argument, while individual-level predicates lack this argument.[4] Kratzer gives a number of arguments for the existence of the abstract spatiotemporal argument in stage-level predicates, including availability of the spatiotemporal argument for binding as a variable by an operator. Following the argument-linking analysis of Williams (1981), Kratzer assumes that all arguments except the external argument are realized at D-structure within the maximal projection of their predicate (the VP in this case). The external argument then appears external to the predicate ([Spec,IP]).

Thus, in Kratzer's account stage and individual level predicates thus differ in their external arguments- stage-level predicates have the abstract Davidsonian argument,

4 Kratzer's spatiotemporal argument is not meant to be taken as being equivalent to the event argument proposed in Davidson (1967).

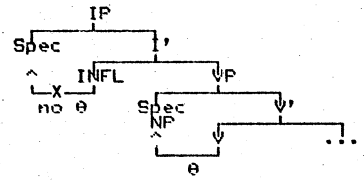
while individual-level predicates map the subject NP to the external position at D-structure. In other words, subjects of individual-level predicates are base-generated in [Spec,IP], and subjects of individual-level predicates are base-generated in [Spec,VP].

2.1.1 Inflection and the Stage/Individual Contrast

Kratzer's account attempts to unify the explanation the variable-binding properties of the two types of predicates with the other semantic properties of the predicates (e.g. the available readings). It does this at the cost of making some unorthodox assumptions about argument linking. In addition, Kratzer's account rules out the possibility of there being <u>any</u> connection to the internal subject position ([Spec,VP]) in individual-level predicates. There is some evidence that this may not be correct. Bonet (1989) suggests that in Catalan, contrary to Kratzer (1989), <u>all</u> subjects must be base-generated in [Spec,IP]. Her argument is based on floated-quantifier constructions, which are acceptable with individual-level predicates, following the NP-movement analysis of Sportiche (1988) in which floated quantifiers originate from the internal subject position.

I would like to propose a variation on Kratzer's approach, which is consistent with the results of Bonet and Sportiche. On this account the difference between the two types of predicates centers on there being two types of Infl associated with the two predicate types. Stage-level predicates have an unaccusative inflection-- the subject is base-generated internal to the VP in [Spec,VP] and Infl does not assign a θ-role to [Spec,IP].

(15) Stage-level predicate




At S-structure the subject of a stage-level predicate raises to [Spec,IP] to receive Case, leaving a trace in [Spec,VP], just as in the case of raising predicates. May (1977, 1985) shows that subjects of raising predicates can be interpreted as if they have been lowered at LF, in an "undoing" of NP movement. In parallel to raising predicates, stage-level predicates also allow lowering of the subject from [Spec,IP] into the lower subject position, [Spec,VP], in the mapping to LF.

Thus, subjects of stage-level predicates at LF may stay in [Spec,IP], or they may be "lowered" to their base position in [Spec,VP]. Stage-level predicates can thus receive either a generic interpretation (subject remains in [Spec,IP] at logical form), or an existential interpretation (subject is lowered into [Spec,VP] at logical form).

The derivation of the existential reading is shown in (16). The subject NP in (16a) can lower to its base position in the VP (indicated by the trace), and then following the LF-Mapping Principle, the VP is mapped into the Nuclear Scope of the logical form in (16b). Existential Closure then applies to the Nuclear Scope, binding the variable corresponding to the bare plural and yielding the existential reading.

(16) a. [$_{IP}$ Linguists$_i$ are [$_{VP}$ t$_i$ swarming the libraries.]]

b. ∃ linguist(x) ∧ swarming-the-libraries(x)

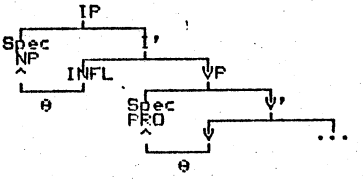
The generic reading is derived as in (17). The subject in (17a) remains in [Spec,IP] at LF, where it is then mapped into the Restrictive Clause of the logical form in (17b). The VP forms the Nuclear Scope, with the variable corresponding to the trace being bound by the abstract operator Gen.[5]

(17) a. [$_{IP}$ Firemen$_i$ are [$_{VP}$ t$_i$ available.]]

b. Gen [x is a fireman] available(x)

Individual-level predicates, on the other hand, differ from stage-level predicates in that they have an inflection which assigns a θ-role to [Spec,IP]. This role has roughly the meaning "has the property x", where x is the property expressed by the predicate. The lexical NP in [Spec,IP] controls a PRO subject in [Spec,VP] which is assigned a θ-role by the verb.

(18) Individual-level predicate




This analysis, with separate θ-roles assigned to [Spec,IP] and [Spec,VP] follows the spirit of remarks made by Chomsky (1976). In discussing the sentence "Dams are built by beavers." Chomsky notes that while the property 'built-by-beavers' is predicated of 'dams', 'dams' also bears the same thematic relation to the verb 'build' as it does in the active sentence "Beavers build dams."

Since the [Spec,IP] is assigned a θ-role, the subject NP

5 As I mentioned earlier, Kratzer also argues for the presence of an event variable. This position seems to be correct, and can be accommodated into my account by assuming that stage-level predicates (but not individual-level predicates) select an implicit 'event', which functions as a variable. (Unlike Kratzer, I do not assume that this event argument is the external argument.)

cannot be lowered in the mapping to LF (cf. May 1985), and thus must be mapped into the Restrictive Clause at LF. In the mapping to LF, the PRO provides the variable in the Nuclear Scope.

This is shown below in (19). The sentence in (19a) is mapped into the logical form in (19b) according to the LF-Mapping Principle given in (14) - the material within the VP (including the variable PRO) is mapped into the Nuclear Scope, and whatever is outside the VP makes up the Restrictive Clause.

(19) a. [$_{IP}$ Linguists [$_{VP}$ PRO know French]]

b. Gen [x is a linguist] x knows French.

With individual-level predicates, only the generic reading is possible. This can be accounted for by the fact that subjects of individual-level predicates are base-generated in [Spec,IP]. They have not undergone NP-movement raising them from [Spec,VP], and thus cannot be lowered since they would not be lowered into a position previously occupied by the NP. Thus, the only possible position for the subject of an individual-level predicate at logical form is the outer subject position, or the position corresponding to the Restrictive Clause.

If the distinction between the two types of predicates is due to a difference in inflection, the question arises of how this difference is to be represented in the case of adjectival predicates. Following Stump (1985), I will assume that there are (at least) two verbs be. The first is a predicative be which selects an individual-level adjective and forms an individual-level predicate (cf. Stump's be$_2$, p. 75). The second be selects a stage-level adjective to form a stage-level predicate (Stump's be$_4$, p. 79).[6] The individual-level be takes the individual-level Infl, and the stage-level

be takes the stage-level Infl.[7]

In summary, in this section I have proposed an account of the stage/individual contrast which parallels the contrast between raising and control predicates. This account of the contrast between stage and individual-level predicates parallels descriptions of epistemic modals as raising verbs (Jackendoff 1972, McCawley 1988 pp. 211-213), as opposed to root modals, which may involve a control-like structure (Zubizarreta 1982).

My account differs from that of Kratzer (1989) in that rather than having the lexical subject of an individual-level predicate have no connection to the inner subject position ([Spec,VP]), the lexical subject in [Spec,IP] is connected to [Spec,VP] by a control relationship. This is desirable, as it is consistent with the the analysis of floated quantifiers proposed by Sportiche (1988), since as Sportiche notes, the floated-quantifier construction can "originate" from PRO. The lexical NP associated with the floated quantifier need not be base-generated in the internal position to allow floated quantifiers with individual-level predicates. Thus, this analysis allows us to retain Sportiche's analysis of floated quantifiers, a consequence not permitted on Kratzer's account.

2.1.2 Bare Plural Objects

One final point to note is that this account predicts that there should be no generic readings for bare plural objects. In most cases, genericity does appear to be subject-oriented. This fact is noted by Chomsky (1975, 1976) and also

6 The stage-level be is similar to, but not identical to Partee's (1977) "active be."
7 Alternatively, the contrast between stage and individual-level adjectives could be represented as a difference in the argument structure of the adjectives themselve (cf. Moltmann 1989).

discussed in Carlson (1977).

Carlson (1977, p. 186 ff.) notes that there are some transitive verbs which do result in generic readings for bare plural objects. These are verbs such as 'like', 'hate', 'fear', 'loathe'-- the experiencer predicates.

(20) Cellists hate boring bass lines.

In (20) both the subject and object seem to be interpreted generically. Thus, it appears that objects of experiencer predicates can somehow escape the Nuclear Scope and be mapped into the Restrictive Clause, to be bound by Gen along with the subject. I will follow Kratzer (1989), who noting a parallel to S-structure scrambling in German, proposes that objects of experiencer predicates are scrambled out of the VP at LF (presumably adjoining to IP), and can thus be mapped into the Restrictive Clause.

2.1.3 Summary

To summarize, I assume that there is a correspondence between the X-bar representation at LF and the Heim -style logical forms in which the VP maps into the Nuclear Scope and material outside of the VP maps into the Restrictive Clause.[8] While all subjects appear in [Spec,IP] at S-structure in English, at LF the subjects of stage and inidvidual-level predicates differ in position: individual-level subjects can only appear in the outer position, and are mapped into the Restrictive Clause, stage-level subjects can appear in the inner position and be mapped into the Nuclear Scope. This difference derives from differing properties of Infl in the two types of predicates, which results in the stage-level predicates being given an analysis parallel to raising verbs, and individual-level predicates being analyzed as parallel to control structures.

In the next section I discuss the mapping from S-structure to LF in German. I will assume that German shows the same contrast in Infl as English, but in German the parallel between position of the subject and the Restrictive Clause and Nuclear Scope is more transparent since the subject need not appear in [Spec,IP] at S-structure. I propose an analysis in which the procedure for deriving logical representations is basically the same for English and German, but the two languages differ in when certain well-formedness conditions apply in the derivation.

## 2.2 German: The Earliness Principle and Bare Plurals

Considering the question of the mapping from S-structure to LF in German presents some interesting phenomena. As an initial assumption, I propose that German differs from English in that subjects do not obligatorily appear in [Spec,IP] at S-structure. In other words, subjects can receive nominative Case in [Spec,VP] and thus can remain in the internal position at S-structure (Webelhuth 1989). This

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8 This raises the question of how small clause complements are to be interpreted. If the VP is the domain of Existential Closure it is expected that bare plurals within small clauses would be "caught" by Existential Closure, and given an existential reading. This is not always the case. The existential reading does not seem to be available for subjects of small clause complements of consider:

(i) a. I consider firemen available.
b. I consider firemen intelligent. (only generic reading in both cases)

ECM verbs seem to more or less allow both existential and generic interpretations of complement subjects:

(ii) a. I believe firemen to be available. (both generic and existential)
b. I believe firemen to be intelligent.
c. ??I believe Belgians to know Flemish.

For-clauses also allow both readings:

(iii) a. For firemen to be available is the least we should expect. (ambiguous)
b. For firemen to be intelligent is the least we should expect. (generic)

With-clauses, on the other hand, do not seem to permit a generic reading, and are generally bad with individual-level predicates:

(iv) a. With firemen available, we are well protected against immolation.
b. *With firemen intelligent, we have nothing to fear.

While I have no explanation at this point for this range of variation, the possibility of generic readings points to a clausal constituent structure for the complement in (i) (Chomsky 1981, Stowell 1981, Safir 1983; contra Williams 1983), resulting in an embedded tripartite logical form.

raises the question of how the two S-structure positions of the subject are mapped into logical representations. In considering this question, I will begin with the simplest hypothesis, namely that external S-structure subjects are mapped into the Restrictive Clause, and internal S-structure subjects are mapped into the Nuclear Scope.

This hypothesis can be derived by drawing upon the guidelines for derivations proposed in Pesetsky (1989). Following the approach outlined in Chomsky (1989), Pesetsky proposes that derivations are subject to an "Earliness Principle" (an alternative to Chomsky's Principle of Least Effort). This principle requires that constraints on representations be satisfied as early as possible on the hierarchy of levels.

Pesetsky discusses several applications of this principle, but the most relevant to the issues discussed here is WH-movement in Slavic. Pesetsky suggests that there is a Scope Filter for WH-phrases which requires that all WH-phrases be assigned scope. The Earliness Principle requires that this filter be satisfied as early as possible in the derivation. Thus, in languages allowing multiple WH-movement at S-structure (Slavic), the Scope Filter must be satisfied at S-structure. For languages without this option (e.g. English), the Scope Filter must be satisfied at LF.

Application of the Earliness Principle can be extended to the derivations of the logical forms I have been discussing here. In this case, it is the interpretation of bare plural NPs which is at stake. Assuming that bare plurals are interpreted as variables (along the lines of Heim 1982), then it is required that at some point in the derivation these variables will be bound by some operator. It is this condition which must be satisfied as early as possible. This

requirement can be stated as follows:

(21) Interpretation Requirement
Bare plurals are variables which must be bound by one of
(i) an overt operator (such as an adverb of quantification)
(ii) the abstract operator Gen (generic reading)
(iii) Existential Closure (existential reading)
where the domain of Existential Closure is the VP, and Gen binds all variables which appear outside of the VP (forming the Restrictive Clause).

Crucially, the requirement in (21) is stated without reference to any particular level at which it must hold.

I would like to propose that what I have called the "LF-Mapping Principle" should also be stated in level-neutral terms:

(22) Stage/Individual Contrast:
Subjects of stage-level predicates can be mapped into either [Spec,IP] or [Spec,VP]. Subjects of individual-level predicates must stay in [Spec,IP].

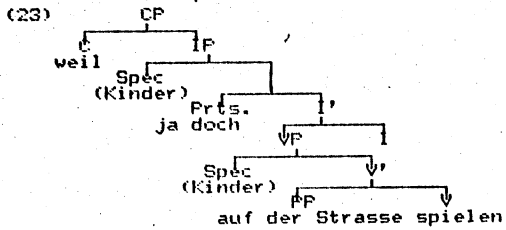
In English, where all subjects must appear in [Spec,IP] at S-structure due to Case-assignment requirements, no S-structure distinction between internal and external subjects can be made. Therefore the distinction between stage and individual-level subjects and the satisfaction of the Interpretation Requirement is delayed until LF. German, however, allows VP-internal subjects at S-structure, so the stage/individual contrast can be expressed at S-structure and the Interpretation Requirement must be satisfied at S-structure whenever possible.[9]

This proposal leads to a clear prediction regarding the interpretation of bare plural subjects in German: the S-structure position of bare plural subject should determine the available reading for the subject. A subject in the outer position should have a generic reading, and a subject in the inner position should have an existential reading.

9 This does not rule out the possibility that in some instances S-structure constraints such as subjacency might cause the satisfaction of the Interpretation Requirement to be delayed until LF in German.

To diagnose the S-structure position of the subject, I use the sentential particles ja and doch. I am assuming that these particles are sentential adverbs and appear at some kind of "clausal boundary" (cf. Jackendoff (1972) and his discussion of sentential adverbs in English).[10] If in this case the boundary is taken to be the VP, an NP to the left of the particles is in the outer subject position (as in (24a)) and an NP to the right of the particles is in the inner position (as in (24b)). In this way a subject NP can appear in either of the two subject positions at S-structure. These relationships are illustrated in the tree below.

(23)




The subject NP Kinder can appear in either position, with the expected contrast in readings: in the outer position the generic reading is available, and in the inner position the existential reading is available:

(24) a. ...weil Kinder ja doch auf der Strasse spielen
...since children prt prt in the street play
'since children play in the street'
(generic reading only)

b. ...weil ja doch Kinder auf der Strasse spielen
'since there are children playing in the street'
(existential reading only)
(Angelika Kratzer, p.c.)

Assuming a direct correspondence between the S-structure

[10] Hentschel (1986) proposes that the sentential particles in German immediately precede the "rheme" of the sentence. This seems to be descriptively correct, but I will not undertake an investigation of the possible correlation between the theme/rheme distinction and the internal/external distinction that I am investigating here in this paper.

and the logical form, as required by the Principle of Interpretation and the Earliness Principle, the VP is taken to correspond to the Nuclear Scope. The "inner" subject position within the VP is thereby bound by Existential Closure (along with everything else inside the VP). When the bare plural subject is in the inner position, to the right of the particles, only the existential reading should be possible, since the NP is within the Nuclear Scope. This prediction is borne out by (24b).

The "outer" subject position in the syntactic structure corresponds to the Restrictive Clause at logical form. An NP in this position is outside of the Nuclear Scope, and therefore cannot be bound by Existential Closure. In (24a) the bare plural subject is in the outer position, to the left of the particles. As expected, in the absence of of an overt quantifier only the (default) generic reading is possible. The Earliness Principle also blocks lowering of an external subject.

There is one complication: German also allows scrambling, a process by which constituents can be moved out of their base positions and adjoined to IP (see Fanselow (1986), Webelhuth (1989), and the discussion in von Stechow and Sternefeld (1988)). I will assume that these adjunction positions, being external to the VP, are also mapped into the Restrictive Clause of the logical interpretation. Thus, the Restrictive Clause of the logical form actually corresponds to <u>all</u> positions outside the VP, rather than just the [Spec,IP].[11]

Since adverbial particles as well as NPs can be

11 The availability of adjunction to IP at S-structure in German raises the possibility that scope assignment to quantificational NPs (QR) might also be subject to the Earliness Principle and satisfied at S-structure. While a detailed examination of this possibility is beyond the scope of this paper, it does appear that scrambling does affect scope relations (cf. von Stechow and Sternefeld 1988).

scrambled, NPs appearing to the right of a particle may in fact have been scrambled out of the VP, and thus be mapped into the Restrictive Clause. Thus, while in the unmarked case subject NPs to the right of particles in sentences such as (24b) are in [Spec,VP] (and are mapped into the Nuclear Scope), this is not a hard and fast generalization. Although it is difficult to diagnose in many cases whether scrambling has occurred, there are frequently intonational indications (Lenerz 1977, Lötscher 1983). In particular, NPs external to the VP are less likely to be stressed.[12] For example, the generic reading is generally only possible in (24b) if the subject NP Kinder is deaccented. In the case of an NP appearing to the left of the particles, as in (24a), there is no question about its status: it is in a position external to the VP, and is mapped into the Restictive Clause.

If the generic and existential readings of the bare plural subject correspond (roughly) to the outer and inner subject positions respectively, then a prediction is made concerning sentences analogous to those in (24) with stage and individual-level predicates. With stage-level predicates, which allow both the generic and existential reading, the bare plural should be able to appear in either the inner or the outer position. Individual-level predicates, which allow only the generic reading, should permit the bare plural only in the outer position. Stage-level predicates do in fact allow the bare plural to appear in both positions, with two readings resulting:[13]

12 This intonational contrast between external (unstressed) and internal (stressed) subjects seems to exist in other languages as well. Bonet (1989) reports that postverbal subjects, which she analyzes as being VP-internal, must be focused. Not surprisingly, this also correlates with the theme/rheme distinction discussed in Hentschel (1986).

13 Manfred Krifka (p.c.) has pointed out to me that the (b) examples can also (weakly) allow an "existential generic" reading which can be paraphrased as "Generally, there are professors available (in this town)." or "Generally, there are sharks visible (off the coast of Florida)." The bare plural subject, however, has an existential reading.

(25) a. ...weil Professoren ja doch verfügbar sind.
since professors prt prt available are
'since professors are available'
(generic reading only)

b. ...weil ja doch Professoren verfügbar sind.
since prt prt professors available are
'since there are professors are available.'
(existential reading only)

(26) a . ...weil Haifische ja doch sichtbar sind.
since sharks prt prt visible are
'since sharks are visible.'
(generic reading only)

b. ...weil ja doch Haifische sichtbar sind.
since prt prt sharks visible are
'since there are sharks visible.'
(existential reading only)

(27) a. ...weil Linguisten ja doch Kammermusik spielen.
since linguists prt.prt. chamber music play
'since linguists play chamber music.'
(generic reading)

b. ...weil ja doch Linguisten Kammermusik spielen.
since prt. prt. linguists chamber music play
'since there are linguists playing chamber music.'
(existential reading)

With individual-level predicates, on the other hand, the bare plural can appear in the outer position to give a generic reading, but the bare plural in the inner position is a bit odd. If the predicate is focussed (and the subject deaccented), the generic reading is possible (corresponding to scrambling of the subject and the particles), but not the existential:

(28) a. ...weil Wildschweine ja doch intelligent sind.
since wild boars prt prt intelligent are
'since wild boars are intelligent.'
(generic reading only)

b.*?...weil ja doch Wildschweine intelligent sind.
since prt prt wild boars intelligent are

(29) a. ...weil Abgottschlangen ja doch taub sind.
since boa constrictors prt prt deaf are
'since boa constrictors are deaf.'
(generic reading only)

b.*?...weil ja doch Abgottschlangen taub sind.
since prt prt boa constrictors deaf are

(30) a. ...weil Wolfshunde ja doch Deutsch können.
since German shepherds prt.prt. German know
'since German shepherds know German.'
(generic reading only)

b.*?...weil ja doch Wolfshunde Deutsch können.
since prt.prt. German shepherds German know

Thus, the data with stage and individual-level predicates coupled with some assumptions about the properties of scrambling as adjunction to IP in German support the correspondence between the two S-structure subject positions and the generic and existential readings of the bare plural in German.

In summary, stage and individual-level predicates in German, as in English, differ in where the (lexical) subject is generated. German, however, differs from English in that subjects can receive Case in the internal position ([Spec,VP]), with the result that S-structure raising to [Spec,IP] is optional. This fact, coupled with Pesetsky's (1989) Earliness Principle, leads to the result that the S-structure position of bare plural subjects may determine the available reading(s).

## 3.0 Extraction and the Stage/Individual Contrast

In this section I examine more closely the S-structure contrast in German between stage and individual level predicates with respect to the position of the subject. Given that subjects in German can appear in either [Spec,IP] or [Spec,VP] at S-structure, it is expected that there might be extraction contrasts due to the fact that [Spec,VP] is L-marked while [Spec,IP] is not (Chomsky 1986). In this section I look at two constructions in German which involve extraction from NPs. In both of these constructions the stage vs. individual-level distinction proves to be relevant in those cases involving extraction from the subject position.

Furthermore, the double-subject structure I outlined in the previous section plays a role in explaining the contrasts between the two types of predicates with respect to extraction. These constructions further support the hypothesis that in German there is an S-structure contrast in the position of the subject in stage-level and individual-level predicates. In the sections that follow, I first present the data from the two constructions, and then show how the data can be explained in the account presented so far.

### 3.1 Was-für Split

The first construction is the so-called Was-Für Split.[14] As den Besten (1983) points out, in a sentence like (31a) the sequence was für N constitutes an NP, with was für functioning as a lexically frozen specifier.

(31) a. Was für Bücher hat er gelesen?
what for books has he read
'What kind of books has he read?'

b. Was hat er für Bücher gelesen?
What has he for books read

In addition to appearing as a unit as in (31a), the specifier was für can also be "split" by fronting the was portion, as shown in (31b). Den Besten observes that this splitting is subject to the following condition: the NP that the was is extracted from must be governed by the verb. Thus, in the following examples extraction from the subject and the indirect object is not permitted:

14 Similar constructions exist also in Dutch (the wat-voor split, discussed in Bennis 1983) and Yiddish (the vos-far split). The Dutch facts are similar to the German, but are complicated by the obligatory occurrence of the adverbial pronoun er in existential constructions (see Bech (1952), Bennis (1986)). I have no data on the Yiddish construction at this time.

(32) a. *Was haben für Leute deine Mutter besucht?
what have for people your mother visted
'What kind of people have visited your mother?'

b. *Was hast du für Leuten deinen Aufsatz geschickt?
what have you for people your paper sent
'What kind of people have you sent your paper to?'
(den Besten 1983)

Den Besten also notes that with unaccusative verbs extraction is possible:

(33) Was sind da für Sachen passiert?
what are there for things happened
'What kind of things have happened?'

Den Besten claims that with unaccusatives like (33) the split improves as more material intervenes between the finite verb and the stranded portion of the subject NP. He does not note however, that the stage/individual level distinction also produces a contrast (Angelika Kratzer, p.c.):

(34) a. *Was sind für Leguane intelligent?
what are for iguanas intelligent
'What kind of iguanas are intelligent?'

b. Was sind für Leguane verfügbar?
what are for iguanas available
'What kind of iguanas are available?'

(35) a. *Was sind für Abgottschlangen taub?
what are for boa constrictors deaf
'What kind of boa constrictors are deaf?'

b. Was sind für Abgottschlangen sichtbar?
what are for boa constrictors visible
'What kind of boa constrictors are visible?'

(36) a. *Was sind für Schuhe wasserdicht?
what are for shoes waterproof
'What kind of shoes are waterproof?'

b. Was sind für Karotten im Kühlschrank?
what are for carrots in-the refrigerator
'What kind of carrots are in the refrigerator?'

(37) a. *Was können für Studenten Französisch?
what know for students French
'What kind of students know French?'

b. Was sind für Tiere auf der Straße?
what are for animals on the street
'What kind of animals are in the street?'

With the individual-level predicates **intelligent, taub** ('deaf'), and **wasserdicht** ('waterproof') the extraction is

bad, and with the stage-level predicates verfügbar ('available'), sichtbar ('visible'), Französich können ('know French'), and locative PPs such as im Kühlschrank ('in the refrigerator') and auf der Straße ('in the street') the extraction is good.[15]

This contrast can be explained by recalling the syntactic difference between the two kinds of predicates: Individual-level adjectival predicates require the subject NP to be in the external subject position ([Spec,IP]) but stage-level adjectival predicates allow the subject to be in the internal position ([Spec,VP]). The contrast in (34) reduces to a contrast between the two subject positions with regards to extraction. Extraction is possible only from the inner subject position.[16]

### 3.2 Split Topics

A similar contrast between stage and individual-level predicates holds in the German Split-Topic construction. There are several analyses of this construction (Fanselow 1988, van Riemsdijk to appear, Webelhuth 1985). I will roughly follow van Riemsdijk's analysis and simply assume that, just as in the was-für split, extraction from an NP has taken place (for arguments that this construction does indeed involve movement, see van Riemsdijk to appear).[17] The split-topic construction is illustrated by the following example:

---

15 There is a reading of sichtbar which has an individual-level meaning (i.e. visible to the naked eye'). In contexts where this reading is appropriate the extraction is rather awkward:

?? Was sind für Mikroben sichtbar?
what are for microbes visible
'What kind of microbes are visible (to the naked eye)?'

16 The internal/external distinction between subjects of stage and individual level predicates can also be adapted to Bennis' (1983) account of the Dutch wat-voor split as reanalysis since what is crucial for Bennis' analysis is that the NP from which the split is made be in close proximity to the verb.

17 Van Riemsdijk's analysis also involves a process of "regeneration", but this is not relevant to the discussion at hand here.

(38) [Giftige Schlangen]$_i$ hat er [keine $t_i$] gesehen.
poisonous snakes has he none seen
'As for poisonous snakes, he hasn't seen any.'

In (38) a portion of the NP **keine giftige Schlangen** ('no poisonous snakes') has been extracted, leaving behind **keine** (and presumably also a trace). While this construction has many interesting properties, and presents interesting problems which are discussed in the papers already mentioned, I will be focusing only on a particular fact pointed out by Angelika Kratzer (p.c.).

In parallel with the **was-für** split I described in the preceding subsection, the splitting of a subject NP is allowed only with stage-level predicates and unaccusatives. With individual-level predicates the extraction is bad.

(39) a. *Wildschweine sind viele intelligent.
wild pigs are many intelligent
'As for wild pigs, many are intelligent.'

b. Wildschweine sind viele verfügbar.
wild pigs are many available
'As for wild pigs, many are available.'

(40) a. *Haifische sind viele taub.
sharks are many deaf
'As for sharks, many are deaf.'

b. Haifische sind viele sichtbar.
sharks are many visible
'As for sharks, many are visible.'

(41) a. *Schuhe sind viele wasserdicht.
shoes are many waterproof
'As for shoes, many are waterproof.'

b. Karotten sind viele im Kühlschrank.
carrots are many in-the refrigerator
'As for carrots, many are in the refrigerator.'

(42) a. *Linguisten wissen das viele.
linguists know this many
'As for linguists, many know this.'

b. Mücken haben ihn viele gebissen.
mosquitos have him many bitten
'As for mosquitos, many have bitten him.'

Once again the extraction contrast can be described as a prohibition on extraction from the outer subject position,

the [Spec,IP]. The two types of adjectival predicates, exemplified by **intelligent** and **verfügbar** ('available'), differ in where the subject NP may appear at S-structure. With **intelligent** (individual-level) the NP must be in the outer subject position ([Spec,IP]), and with **verfügbar** (stage-level) the NP can appear in the [Spec,VP]. The grammaticality contrast between (39a) and (39b) results from the fact that extraction from the outer subject position is not possible, just as in the was-für split.[18] [19]

### 3.3 Accounting for the Extraction Contrast

The data in sections 3.1 and 3.2 can be explained by the double-subject structure plus the syntactic formulation of the stage/individual distinction proposed here as it is reflected in the surface syntax of German. Individual-level predicates force the subject NP to remain in the outer subject position, while stage-level predicates allow the NP to appear in the inner position. The two subject positions are further distinguished in that in German, subextraction is not possible from the outer subject position, while it is possible from the inner subject position. That extraction is

18 Moltmann (1989) argues against the hypothesis that it is the stage/individual contrats which is relevant for the acceptabilty of both the was-für split and the split topic constructions. Her argument overlooks Kratzer's (1989) claim that the two split constructions are diagnostics of extraction from an internal position, rather than extraction from a stage-level predicates. Thus, extraction from individual-level unaccusatives (with internal subjects) is expected to be good. These constitute one group of Moltmann's counterexamples (e.g. 'be known to', 'belong to' etc.). Moltmann's other counterexamples fall into a class which are somewhat problematic in both English and German ('sick', 'nervous', 'drunk'). These are temporary states, but also seem to show many of the properties of individual-level predicates. In other words, the stage/individual distinction gets "mushy" in spots. Rather than discard what is still a useful distinction, I will just stick to the more canonical examples of the two types.

19 As pointed out to me by both Cleo Condoravdi and Sabine Iatridou (p.c.), there is a discontinuous construction in Modern Greek which similar to the German split-topic construction. The facts are not clear, but there does not appear to be a strong contrast between stage and individual-level predicates in the Greek construction. Rather than stipulate that the contrast proposed here is language-specific, I will assume that the German and Greek constructions are not identical. This is not an unreasonable assumption, as there are in fact other discontinuous constructions in German which show different properties with respect to the stage/individual contrast. I will leave the investigation of the various constructions with discontinuous constituents to further research.

not possible from [Spec,IP] is a familiar phenomenon (cf. Kayne 1981, and the Condition on Extraction Domain of Huang 1982). In the framework of Chomsky (1986), extraction from [Spec,IP] results in a subjacency violation (Chomsky 1986, p. 31 ff.), while extraction from [Spec,VP] need not violate subjacency. In the "Barriers" framework, a subjacency violation results from the crossing of two barriers, where a barrier is defined as follows:

(43) Definition of barrier (Chomsky 1986):
$\gamma$ is a barrier for $\beta$ iff:
a. $\gamma$ immediately dominates $\delta$, $\delta$ a blocking category (BC) for $\beta$ OR
b. $\gamma$ is a BC for $\beta$, $\gamma \neq$ IP.

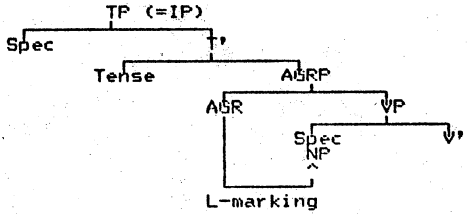
(44) definition of blocking category:
$\gamma$ is a BC for $\beta$ iff $\gamma$ is not L-marked and $\gamma$ dominates $\beta$.

(45) L-marking:
$\alpha$ L-marks $\beta$ iff $\alpha$ is a lexical category that $\theta$-governs $\beta$.

The [Spec,IP] is not L-marked, and is thus a Blocking Category and a barrier.[20] IP inherits barrierhood from [Spec,IP]. Thus, extraction from [Spec,IP] results in the crossing of two barriers, constituting a subjacency violation. Stage-level adjectival predicates allow the subject NP to appear in the [Spec,VP]. I will follow Chomsky (1986) in assuming that if a head L-marks a maximal projection, it also L-marks the specifier of the projection (Chomsky 1986, p. 24). At this point, for the sake of clarity, I will assume the structured Infl argued for in Pollock (1989). In this configuration, AGR L-marks the VP (assuming that AGR is lexicalized by the verb raising, cf. Pollock). This results in both the VP and [Spec,VP] being L-marked.

20 Note that this means that the verb raised to Comp in matrix clauses (verb-second) in German cannot L-mark IP.

(46)




Therefore, extraction from [Spec,VP] can take place without crossing any barriers. This covers the case of stage-level predicates, in which the lexical NP subject is base-generated in [Spec,VP]. In the case of individual-level predicates, [Spec,VP] is occupied by PRO. While PRO is θ-marked by V, it must be ungoverned. Therefore PRO moves from [Spec,VP] to an ungoverned position external to VP ([Spec,VP] presumably being governed by V and perhaps also AGR), the specifier of AGR, which is otherwise not generated (see also Pesetsky 1989).

One remaining potential difficulty is that if AGR can be lexicalized and serve as a L-marker for [Spec,VP], then by the same token it might be supposed that Tense could be lexicalized and thereby L-mark [Spec,IP]. This situation arises as a result of assuming two subject positions, and the sturctured Infl argued for by Pollock (1989), assumptions which were not made in the original (Chomsky 1986) exposition of the Barriers framework. Therefore, it is not surprising that the definition of L-marking should need to be revised:

(47) a. L-marking (revised):
α L-marks ß iff α is a lexical category that θ-governs ß, and α c-commands ß.

b. C-command:
α c-commands ß iff α does not dominate ß and every γ that dominates α dominates ß.

This revised definition allows AGR to L-mark [Spec,VP], but

rules out L-marking of [Spec,IP] by Tense by imposing a c-command requirement on L-marking. In (46) it can be seen that the intervening node T' dominates Tense (the potential L-marker), but not [Spec,IP]. On the other hand, [Spec,VP] is L-marked by AGR, since every node which dominates AGR also dominates [Spec,VP].

Thus, with a slight revision of the Barriers framework, the difference in extraction possibilities between stage and individual-level predicates follows straightforwardly from the different positions of the subject in the two types of predicates.

## 4.0 Conclusion

In this paper I have argued for a syntactic characterization of the stage/individual contrast. I also proposed a procedure for mapping onto Heim-style logical forms, in which the VP corresponds to the Nuclear Scope, and forms the domain of Existential Closure in the sense of Heim (1982). These two points enabled me to account for the distribution of the generic and existential readings of the bare plural in English and German, as well as explain contrasts in extraction from subjects of stage and individual-level predicates in German.

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